



Natural
Resources
Conservation
Service



Technology Report

National Cartography and Geospatial Center

Fall 1996

NRI Data Analysis Software Upgrade

Multi-year analysis for detecting change and trending reports and a graphing option are among the new features of Version 1.1 of the National Resources Inventory Data Analysis Software (DAS) recently released by the NRCS Natural Resources Inventory Division.

The DAS was developed by the Natural Resources Conservation Service (NRCS) to assist in the analysis of National Resources Inventory (NRI) data. It assists the user in querying the data base without knowledge of computer languages, data base design, or data base element relationships. The graphical, window-based interface of DAS is easy for both experienced and novice users. This upgrade responds to recommendations of the Blue Ribbon Panel on Natural Resource Inventory and Performance Measurement, as well as to suggestions from users of the current version of the software.

The NRI is an inventory of land cover and use, soil erosion, prime farmland, wetlands, and other natural resource characteristics on non-Federal rural land in the United States. The 1992 NRI is the most extensive inventory yet conducted on the nation's non-Federal land—some 75 percent of the nation's land area. Information is available for 3 years—1982, 1987, and 1992. From this time series, changes and trends in land use and resource characteristics over the period can be estimated and analyzed. In addition, the NRI is linked to the NRCS soil interpretation records data base to provide additional soils information.

DAS can generate many types of user defined natural resource reports. In addition to reports that display acreage within specified areas, a new feature also displays

the percent of the geographic area the acreage value represents.

The software includes an imbedded statistical package that automatically computes the margin of error associated with each report estimate. This is useful for assessing the confidence level of each report's content.

New map generation features provide a better illustration of spatial relationships and trending in data. DAS processes tabular data from reports via the Map Editor into interpretative maps using interactive input that does not require a GIS background. Mapping is done transparently through use of imbedded GRASS geographic information system and MAPGEN commands. Map features, such as title, legend, and source note, are controlled by the software user. Map format options include either landscape or portrait orientation of a map on the page.

A new graphics option can display complex data relationships. DAS processes tabular data from reports and enables the user to display the report result as a stack chart, bar chart, stacked bar chart, line chart, or pie chart.

Particular graphic representation can be inverted or transposed. It can be depicted within a grid or in a three-dimensional format.

The release of DAS, Version 1.1, includes the software, User's Guide, Tutorial, Technical Support Reference, and Quick Card Installation Guides. The 8 mm data cartridge distributed with the first version is still current. The enhancements included are consistent with the user interface pro-

vided with Version 1.1 therefore, users with 1.0 experience can easily learn the new features by working through the DAS Version 1.1 Tutorial and referencing the User's Guide.

The software environment DAS is designed for is the same as for Version 1.0, which is:

- SUN Solaris 1.X
- Motif window manager with X-Windows
- Online versions of Informix, Version 5.01
- GRASS GIS, Version 4.1 or higher

Several week-long "train-the-trainer" sessions were conducted for DAS 1.0 in the fall of 1994. The materials provided to each student are still applicable and useable as a reference in continuing to train new users of the DAS. The NRI Division and Resources Inventory Support Branch at National Cartography and Geospatial Center will hold one or more "train-the-trainer" teleconferences with regional contacts. When the regional contacts have been trained, they will be equipped with the knowledge and skills to support the use of DAS in their region.

For installation and technical information, contact: Fort Collins Help Desk, (970) 282-5559. For users who do not have necessary software, NRI data is available on CD-ROM's. They can be ordered by calling 800-672-5559. For more information contact Henry Bogusch at (817) 334-5292 Ext. 3111, VoiceCom 9000-965-2180, email hbogusch@ftw.nrcs.usda.gov.

1995 TIGER/Line Data Available

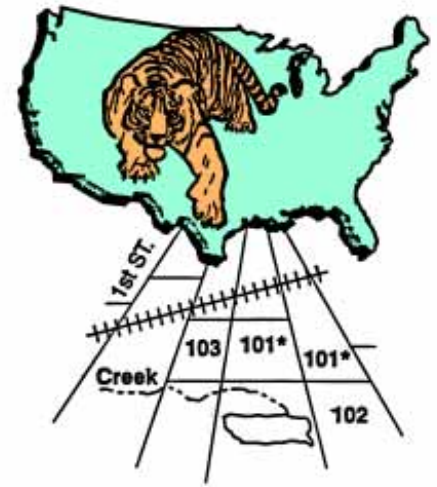
The Bureau of the Census has announced the availability of the TIGER/Line 1995 data, Topologically Integrated Geographic Encoding and Referencing data. The NCG has acquired this data and is making it available to its customers. It will be available through ftp access over Internet. TIGER/Line data is one of the most useful data bases NRCS personnel use in GIS and cartography. TIGER/Line has been distributed by the NCG on magnetic tape and CD-ROM since 1990.

NCG has made use of three different versions of TIGER/Line and skipped a few versions that contained updates of little interest to our applications. All TIGER/Line has contained similar data items. The number of records has been increased to accommodate data for special needs. The bulk of data still captures a large data base of line, area, and point information on transportation, hydrography and boundary features of every county, parish, borough and independent city in the United States.

The TIGER/Line 1995 data will include several improvements that GIS staffs may include in the data base holdings of State offices, Regional offices, Major Land Resource Area offices, Centers or Institutes.

- The data is on 6 CD-ROM's instead of 44 CD-ROM's necessary for the TIGER/Line 1992.
- The data base coordinates have been converted to the 1983 North American Datum (NAD83).
- Improvements have been made in the address range and feature coverage between this version and the last (TIGER/Line 1994).

Many improvements have been made through cooperative programs and special censuses. Many NRCS TIGER users may still use older versions of the data base; however, they will find a more current data base when acquiring the TIGER/Line 1995 to use for GIS or mapping applications.



Should you need any further information, contact:

Jim Carrington
(817) 334-5559 ext 3018
jcarrington@ftw.nrcs.usda.gov
or go to the Census Bureau at
<http://www.census.com>.

Developing a National Data Clearinghouse for NRCS

In May 1996, NCG was issued a charter to develop and maintain a national data clearinghouse for NRCS. The job is to coordinate, rather than centralize, data management and dissemination activities for the Agency coupled with offering onsite services as required. NRCS Data Clearinghouse offers a service to data stewards who have no easy access to archive and disseminate data through channels that they hold in the public trust. The Clearinghouse presents no conflict of interest with offices of the NRCS that offer data services to the public.

Services offered to the Agency by NCG, as part of the new clearinghouse function, include:

- data archiving,
- dissemination online (via ftp) or on CD-ROM,
- maintenance of an "800" number for inquiries about NRCS data,
- assistance with design and contract for putting data on CD-ROM, and
- membership in the Open GIS data standards process.

Over 300 Gbytes of data are offered to Agency offices and the public. NCG expects onsite volume to increase tenfold over the next 3 years. NCG is now pre-

paring for the next step: offering much of that data online as direct access to the data base with World Wide Web browsers. This would enable any customer to subset and download any portion of any online data base at any time. This is already done quite effectively by the Agency's Plant Materials Center with the NRCS PLANTS Database. NCG hopes to serve the 1982, 1987, and 1992 National Resources Inventory data as its first online offering by the end of this calendar year.

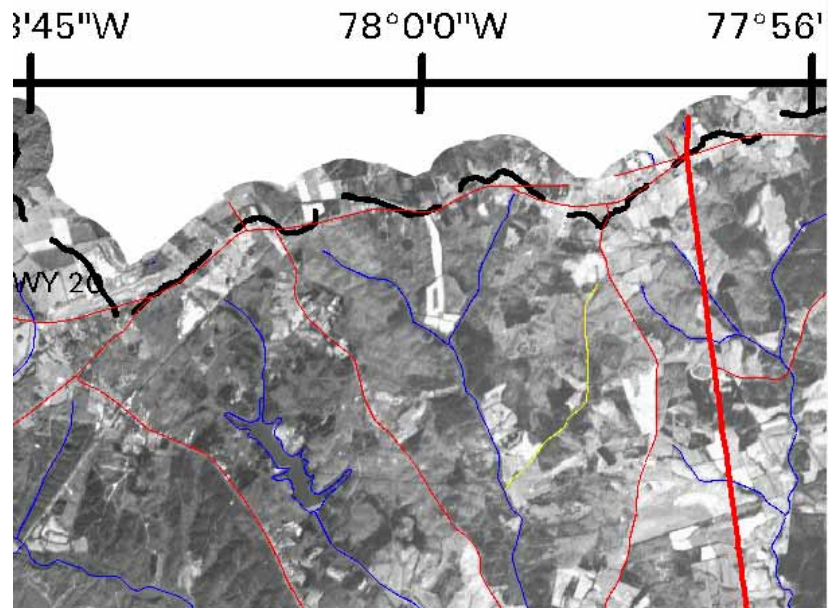
Check NRCS Data Clearinghouse on the web site, www.ncg.nrcs.usda.gov/nsdi_node.html.

Software Creates Mosaics

Image processing software is being used at NCG to mosaic Digital Orthophoto Quads (DOQ's) and other digital imagery. The Soil Survey Branch receives DOQ data from the U.S. Geological Survey in Quarter Quad (DOQQ) format. Using mosaic feature, the DOQQ's are mosaicked together to create 7.5" quads, county coverages, and soil survey project areas. Matching the contrast between DOQQ's produces nearly seamless results.

The GIS/Remote Sensing Section is using the software to produce seamless mosaics of SPOT satellite imagery. The image on the upper right is a mosaic of two SPOT scenes over the Lake Anna Watershed in Virginia. The two scenes are joined on the 78 degree meridian, which is also a UTM zone change. The watershed boundary is shown in black, highways in red, and streams in blue.

Development is also being done on scanning, rectifying, and mosaicking 35mm aerial slides over Primary Sampling Units (PSUs). Once rectified, the slides can be used with other digital data to facilitate photo interpretation and measurement for the National Resources Inventory. In the split image (right), a geocoded USGS topographic map has been overlain on a mosaic of two 35mm slides in Pitt Co., North Carolina. The slides were scanned at 2700 dpi, rectified to UTM, mosaicked together, and filtered to remove noise. The join between the slides runs horizontally across the image near the middle. The topographic map was scanned at 300 dpi and rectified to UTM. The geocoded topographic map served as a base for picking ground control points to rectify the 35mm slides. Scale of the image is approximately 1:7920.



For additional information concerning this application contact:
Dorsey Plunk, GIS/Remote Sensing Section (817) 334-5559 Ext 3009
or email: dplunk@ftw.nrcs.usda.gov

Digital Raster Graphics

A Digital Raster Graphic (DRG) is a color scanned image of a U.S. Geological Survey (USGS) topographic map that has been georeferenced to the surface of the earth. A DRG contains all collar information, and complies with National Map Accuracy Standards. The DRG is a low cost digital product that can be used to collect, review, and revise other digital data.

DRG's may be combined with other digital products, such as Digital Line Graphs (DLG), Digital Elevation Model (DEM), Topologically Integrated Geographic Encoding and Referencing (TIGER) files, digital orthophoto quad (DOQ), or satellite imagery. The resulting image provides a stable basis for analyzing and for using digital data for a variety of applications. These applications include watershed analysis, soil studies, environmental planning and assessment, land use study, forest and timber management, and transportation development and planning.

DRG's are available from U.S. Geological Survey and commercial sources. The USGS through an Innovative Partnership agreement with Land Info International is in the process of producing DRG coverage of the United States. They have completed about one-fifth of the United States at 1:24,000-scale.

The USGS DRG is a 250 dpi, 8-bit, 13-color image that is georeferenced to the Universal Transverse Mercator (UTM) projection. USGS distributes DRG's in Geo-Tagged Image File Format (Geo-TIFF) with PackBits compression on CD-ROM. A typical CD-ROM usually contains sixty-four 1:24,000-scale files, two 1:100,000-scale files, and one 1:250,000-scale file.

Commercial sources provide the same product as USGS plus additional product features.

Scales

Sources provide scales—1:24,000, 1:100,000, and, 1:250,000

One source provides additional scale offerings—1:25,000, and, 1:63,360

Features

- color topo maps georeferenced and seamless mosaicing
- 3-D contours
- digital elevation models
- satellite imagery
- customized projection and datum
- compressed or uncompressed formats
- import into common commercial and GRASS formats



Example of digital raster graphics image overlaid with georeferenced data points from erosion capability areas indicated by analyses of the area.

Cost:

Commercial average cost of estimated 200 USGS 1:24,000 quads on each CD is \$495, about \$2.50 per map.

The NRCS NCG Automated Mapping Section has created DRG's and successfully used these products for watershed, general soil, and thematic map applications. For technical assistance call Steve Nechero, (817) 334-5212 ext. 3061. Technical notes and sample ARC Macro Language (AML) are available on request.

Trade names and services mentioned are for specific information and do not constitute a guarantee or warranty of the product by the Department of Agriculture or an endorsement by the Department over other products not mentioned.

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